

AVIATION WEEK

MARCH 15, 1948

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► CURTISS brings to Boeing Stratocruisers many propeller advancements—each *service-proved* . . . each *soundly designed* to meet every demand of modern airline operation.

► Curtiss *pioneered* the development and application of hollow steel blades, automatic synchronization, reverse pitch and many other now generally accepted improvements in propeller design. The Curtiss Propeller is the *only* reversing propeller with thousands of flight hours behind it . . . the *only* reversing propeller *proved in service*.

► Curtiss Propellers will be used on Boeing Stratocruisers for such famous airlines as American Overseas Airlines, Scandinavian Airlines System, and United Airlines.



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The amplifier on Honeywell's Turbo Supercharger is a typical example of how important innovations grow out of sophistication that's backed by sound, practical engineering.

Focusing attention on every important detail, Honeywell Creative Engineering discarded the traditional horned amplifier case. The transformer and Resistor-Condenser components are hermetically sealed and shielded with metal spray. These and other heat-generating units are mounted in separate enclosures outside the chassis. Result: better heat dissipation, more protection from dust and dirt, less radio interference and greater resistance to humidity and temperature extremes.

Here again, as with the Honeywell electronic Fuel Gages and Autopilot, is an instance where Creative Engineering brings together that can be strung together—features that pay out through greater dependability, lower operating costs, less maintenance. Minneapolis Honeywell, Minneapolis 2, Minnesota. In Canada, Toronto 14, Ontario.



Special air gauges incorporating up to eight or as many as twelve of the ultra-compact, ultra-precision, ultra-compact and ultra-precision air gauges are available in a single "off-the-shelf" unit.

Quick KNOCKOUT BLOW for cabin fires!



Here's a Kidde-designed airplane-cabin extinguisher that weighs less than 7 pounds . . . holds more than a quart of anti-freeze water solution. Needs no laborious pumping. Light enough for a stewardess to use easily with one hand. Good for operation down to -99°F!

A vent of the handle "penetrates" a sealed cartridge of carbon dioxide (CO_2) . . . releases this powerful, non-toxic propellant to drive the water stream. Then press the release with the thumb . . . and a penetrating stream quickly kills fires in seat cushions, blankets, paper, other carbonaceous materials.

Extinguisher is easily recharged with plain water during flight. No special tools or other equipment needed . . . just carry a couple of small spare cartridges of CO_2 .

Light, compact, sure in action, here's the ideal extinguisher for airplane cabins. Lightweight brackets are available. Get the full facts today!

This use of CO_2 as the propellant for a water stream is best use of the easy way in which Kidde has harnessed the energy of gas-under-pressure to make flying safer. Kidde engineers are always ready to work with government agencies, aircraft manufacturers and transport companies in developing new applications of gas-under-pressure—or new equipment to utilize the gases more effectively.



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Engineering Service so outstanding
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At Lockheed maintenance men anywhere, and you'll hear high praise for the service Texaco Lubrication Engineers give. Flight schedules have been maintained and many a maintenance dollar saved... because of the willing cooperation of these experts.

If you feel that your engine overhauls are too frequent... that mechanical troubles are causing too many interruptions in service... let a Texaco Lubrication Engineer specializing in aviation, work with you. His wide practical experience is frequently helpful even beyond the field of lubrication.

Remember also, Texaco has the industry's most extensive flow of engine and airplane lubricants and

aviation facts... most meeting A-N specifications than any other brand... as well as a convenient set up to insure ready availability of Texaco Aviation Products and Lubrication Engineering Service everywhere.

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TEXACO Lubricants and Fuels
FOR THE AVIATION INDUSTRY

NOTE: The TEXACO STAR TRIMASTER provides the TONY MARTIN SHOW featuring Miss Young every Wednesday night. See advertisements for times and locations.

THE AVIATION WEEK

'Education'... But How?

Congressmen are not the only ones concerned with getting action on the air policy recommendations. Last week, behind closed doors in New York's Empire State Building, the Board of Managers of the National Air Council considered another means to spur action. This is a proposal for a "public education" campaign that would be a long-range method of stimulating consistent support of the recommendations.

The National Air Council stands life with the brightest promise of any aviation group.

It inherited the funds of the Air Power League, plus the active backing of groups and individuals who had been cool to the League. In addition, it was the creation principally of L. Welch Pogue, former CAB chairman and then president of National Aeronautic Association; Lowell H. Swanson, former NAA executive vice president; and John E. P. Morgan, then executive director of Aircraft Industries Association.

Last week Pogue, unable to attend the NAC meeting due to illness, word a request that NAC defer action on fund raising to finance the educational campaign. Pogue and a group of friends have retained Executive Research Inc. to draw up a plan of action for NAC. Morgan, no longer connected with AIA or NAC, will cooperate with Executive Research. Pogue asked NAC's managerial board to wait until ERI's report is in.

Original Concept

NAC Executive Vice President John Dwight Sullivan declines to disclose what action was taken on Pogue's request. But he expects to release some details of the educational program. This could indicate that Pogue's request was refused and that NAC will proceed as scheduled. It would not be the first time that NAC departed from its founders' plans.

Concept of the National Air Council was a super-aviation organization, differing to an other group but drawing support from and assisting all groups. It would parallel the Automotive Safety Foundation (the Council's original name was Aviation Foundation), and collect and disburse through other organizations all funds for aviation public education, serving adequate means for consistent effort.

It was believed that this device would give aviation its most effective weapon to win at all times public backing for national air policy. Obvious familiar with the original concept feel that NAC's present proposal departs from that concept and is the sub of Pogue's objectives.

To the layman familiar with the genesis of the foundation (or Council), the Pogue telegram looks like possibly the final valley is a misguided detour of the original concept.

More than a year ago, Pogue, Morgan and Swanson was one key aviation figures in manufacturing, transport, government, and private aviation to the foundation idea. Instead of the general aviation organizations (as distinct from the trade groups such as AIA and ATA) making the needs that is hard to support their special activities, most of which are educational as nature, the foundation would collect the funds from supporting companies.

General Approval

The foundation, administered by a board representing those companies, would evaluate activities of other organizations, assisting where desirable. The foundation would do no public work in its own name but always act through existing groups. This concept was universal approval.

But about that time the Air Power League found itself in a box.

It had started out promoting unification—a legislative proposal. Then it discovered it could not raise its free states in a hole. With its hands tied on one key activity, it began looking about for a new "cause" that could justify expenditure of more than \$100,000 in 1946 funds.

APL Takes Over

APL first tried to win support for a proposal to absorb all non trade aviation organizations, beginning with the Air Force Association and Air Reserve Association.

This plan fell flat. Then Pogue approached APL for its backing on the foundation idea. APL proposed to take over the foundation. In the end, a compromise was accepted. APL changed its name and made its governing board more representative. The Council was elected to the Board of Managers of the Council.

Pogue was named to a three man committee to appoint the key executive director. The other two members were former APL officials. Pogue's successor for the executive directorship was voted down, Ed. John Dwight Sullivan, former APL official, got the job of executive vice president. His initial plan was for NAC to launch a national educational campaign in its own name.

This contrasts with Pogue's basic plan for having all promotion done by existing organizations with funds allotted by the Council. And this clash in concepts (perhaps the long-range attainment of recommendations laid down in the two policy reports).

The one thing few in aviation forget is that there have been policy reports in former years. Their long-range effect always was diminished by the growth of public apathy as majority of the reports faded.

Everyone agrees that this time there must be a public education campaign to bolster the policy reports. Who will do it, and how, is part and parcel of an policy planning.



The B-36, world's largest land-based bomber, has a range of 10,000 miles, is powered by six engines and has bomb bay space equal to the volume of four freight cars.

**No Problem
"TOO BIG"
for
PACIFIC-WESTERN**



The photograph shows one of the eleven Model 100000 actuators which, with variations in drum length, depending on job requirements, are incorporated in the B-36.

• ELEVEN SPECIALLY DESIGNED PACIFIC-WESTERN ACTUATORS operate the bomb bay and turret doors of this giant plane. These PACIFIC-WESTERN actuators incorporate a compact, efficient, three-step gear reduction providing a total ratio of 58:1. The servomotor, consisting of motor, gear reduction and cable drum, weighs only 12 pounds but delivers 5600 inch pounds output torque.

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NEWS DIGEST

DOMESTIC

Major Gen. Carl G. East, leader of the first AAF low level bombing mission against the Florent Reservoir in Italy, died in Denver after a long illness. He was seriously injured in a B-25 crash three years ago.

Navy's Anacapa research vessel hit 1000 mph and crashed on a strake of 75 miles in its first test firing at White Sands, N. M.

President Truman requested Congress to liquidate the War Assets Administration by June 30. Renaming surplus disposal unit, would be handled by the Federal Works Agency, under the President's proposal.

Columbia Aircraft Corp. assets will be sold at public auction May 17-18 at Valley Stream, Nassau County, N. Y.

FINANCIAL

Consolidated Value Aircraft Corp.'s annual meeting scheduled for May 17 has been postponed due to auditor's inability to complete report for year ended Nov. 30, 1947 on time. New date will be set later.

Bendix Aviation Corp. reports net income of \$5,216,999 on sales totaling \$141,625,820 for fiscal year ending Sept. 30, 1947. Aircraft production accounted for \$71,488,040 or about 50 percent of total sales.

Aero Supply Manufacturing Co., Inc., reports net loss of \$123,199 for the 1947 calendar year after giving effect to a tax refund of \$124,016. Net sales for the period were \$3,206,192 compared to \$386,187 for the previous year.

FOREIGN

CNRAA Air Transport, China corporation headed by Major Gen. Claire L. Chennault, wartime commander of the 14th U. S. Air Force in China, has been granted a year's extension of its operating permit by the Chinese government. Its cause has been changed to Civil Air Transport.

Ministry of Public Works and Communications of Ecuador has been authorized by executive decree to sign a contract with The American-Globe Airways, Inc. (Panama) to increase the carrier's rates for carrying mail and to reduce schedule frequencies.

Iraq Public Health Authorities have lifted travel restrictions against the frontier to air travel from Syria, Lebanon, Transjordan and Upper Palestine.

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You're looking at tomorrow!

One glimpse of the great new XB-47, built by Boeing for the U. S. Air Force, will project you far into the future. For here it is on a supersonic start—different in design—in revolutionary today as was the first Boeing Flying Fortress in 1935. It is the first bomber specifically designed to take full advantage of jet propulsion.

How fast is it? The actual figures must remain a military secret, but its arrow-like lines and enormous power are enough to tell you it was designed for terrific speeds.

It's a big airplane—roughly the same size as the famous Boeing B-29—and can carry a ten-ton bomb load. Six

turbo-jet engines give it a rated thrust of 24,000 pounds, which is the equivalent of twelve times the power of the Superfortress.

But the most eye-fascinating fact about the XB-47 Superjet is its radically new, aerodynamic design.

The sleek, swept-back wing and tail sections, sleekly beautiful body lines, streamlined nacelle mountings and tandem landing gear look ahead to the era of supersonic speed.

Boeing leadership in research and engineering gave the nation the B-29, the B-36 and the new B-50. Now it opens new vistas for America's Air Force in the realm of jet-propelled flight.



Boeing jet plane XB-47 Superjet nose and tail. Note the jet intake.

BOEING

AVIATION WEEK, March 25, 1949

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AVIATION WEEK

Mar. 25, 1949

NAL-ALPA Heading Toward Showdown

Mail pay issue and court battles loom as the next skirmishes in dispute.

By Alexander McSweeney

MIAMI—Conflict between the "unmovable object," George Theodore Baker, president of National Air Lines, and the "immovable force," David Lewis Behrman, president of the Air Line Pilots Association (ALPA), continued last week to overshadow NAL's other and occasional labor controversy with the International Association of Machinists.

If Baker should win out over Behrman, the result will be somewhat earth-shaking in airline labor relations. Behrman has been winning his previous strike bouts with other unions much larger than NAL. Behrman has admitted that "this is a cold, hard strike." The fact that Daniel G. Connolly, one of the best AFL attorneys, who successfully handled some of Petrillo's recent union cases, is appearing for ALPA is indicative of an "all-out" ALPA effort in the NAL case.

Baker and Behrman concluded their legal tussle for a second of one phase of their conflict scheduled Monday, Mar. 15, in Washington before the Civil Aeronautics Board on NAL's application for increased mail pay.

While Petrillo-Machinists, at Miami last week, more than 100 striking pilots continued to take time walking picket lines in front of NAL passenger ticket office and at the Miami International Airport, wearing their NAL uniforms and service hats, with amiables pre-empting the strike. Out at the airport other pilots hired by NAL as "replacement" for the striking boys were flying "straw" Douglas DC-3s and Lockheed Lodestars over National routes to Washington and New York, New Orleans, Key West, Havana, and intermediate stops.

NAL, reported it has hired 16 of the pilots from a large number of applicants, and that virtually all had previous civilian transport pilot experience, many with major airlines. Applicants from last pilot experience with TWA, American Airlines, Pan American, Braniff, Capital, Western, Northwest, and United, in addition to TACA, Petrom



In front of National Airlines downtown Miami ticket office at the Coliseum Hotel, three National Airlines pilots, two pilots and a supervisor, are walking the picket line with their month-old ALPA strike in confusion, despite the fact that NAL has resumed service with non-union pilots. Left to right, Capt. J. A. Deane, J. K. Madison, and W. R. Brock.



Pilots from three other airlines greet National Airlines Pilot Chuck Hansen, ELROB in uniform, as he picks up Miami International Airport on the month-old NAL pilot strike. In the background, a pilot of the International Association of Machinists, representing the striking clerical workers and mechanics of the airline, looks his sign into the picture. Left to right in foreground: Hansen, Fred Conn, Eastern Air Lines, Paul Borg, Pan American Airways and E. A. Schmitt, Delta Airlines.

For the Air Force, Boeing is building the B-50 bomber, XB-47 jet bomber and C-97 transport for the Army, the B-12 Superfortress and for the major airlines, the roll-back Boeing Stratocruiser.

AVIATION WEEK, March 25, 1949

HEADLINE NEWS 11

PAA Hits at Tie-up Of TACA, Waterman

Steamship company accused of entering air transportation by subterfuge.

Pan American Airways and Waterman Steamship Corp. have tangled in a bitter battle over the future of TACA, S. A., part of the intergovernmental TACA Airways System in which Waterman acquired a substantial interest early last year.

TACA, S. A., a Salvadoran company, has applied to CAB for approval of its foreign air carrier permit covering routes from San Salvador, to Miami and New Orleans. PAA stated that since TACA, S. A., is wholly controlled by TACA Airways System, which in turn is now controlled by Waterman, the case is really an attempt by a U.S. steamship company to get by subterfuge routes that it could not acquire by direct application.

■ **Status Challenge.**—PAA declared that TACA, S. A., is not a bona fide Salvadoran company and hence is not entitled to U.S. routes on the basis of international regulation. Pan Am also explained that Waterman's own application for Latin American routes have been turned down by CAB.

When Waterman acquired its interest in TACA in January, 1947, the carrier's financial position was precarious. TACA Airways System reportedly lost \$7,031,000 in 1946 alone, losing it while an overall deficit in the surplus account of \$1,173,000 and net assets of less than \$2,580,000. Pan Am then claimed that but for the entrance of Waterman on the scene at this time TACA could not have continued operations for any substantial period.

■ **Profit Claim.**—PAA stated that Waterman, because of windfall profits from its steamship operations, could afford to gamble on developing TACA in a market of entering the air transport field. It added that a "transfer" of profits from Waterman Steamship Corp. to a foreign flag airline would render these profits taxable from Federal taxation.

While TACA, S. A., the Salvadoran company, and the TACA system as a whole are in need of more money, there are no present plans for public offering of stock. Losses were substantially smaller in 1947 than in 1946. Paul Richter, TACA Airways system director, stated that Waterman will advance funds necessary for the continued existence of TACA.

■ **Steamships Used.**—TACA's use of steamships furnished by Waterman evoked strong criticism from Pan Amer-

ican. Since March, 1947, at least two (and possibly three) steamships chartered by Waterman to TACA Airways Agency have brought the air carrier revenues in excess of \$450,000, according to PAA.

■ **Waterman Control.**—In attempting to show that TACA, S. A., is not a bona fide Salvadoran company, PAA declared that over 90 percent of TACA Airways System stock is owned by U. S. citizens and the majority of TACA officials are Americans. It added that the DC-4s with which TACA, S. A., operates to the U.S. are leased from Waterman Airlines, that Waterman furnishes maintenance facilities for the craft at New Orleans, that 34 of the 40 Salvadoran company's pilots are U.S. citizens, and that Paul Richter, president of the parent firm—TACA Airways System—was hired by Waterman.

CIO Aircraft Conference Request Faces Tabling

There is little chance that President Truman will grant the request of the United Automobile, Aircraft and Agricultural Implement Workers for a joint national conference of labor, management and government to study what the CIO union describes as a "nail" condition in the aircraft industry. According to White House sources, Truman feels that enough studying has been done by his Air Policy Commission and the Congressional Board.

The labor management government agreement conference was proposed by UAW CIO President Walter P. Reuther on authorization of his executive board. Its purpose, he said, would be to develop mechanical skills needed to produce advanced types of military and commercial aircraft. He also expected a long range view of the situation would provide greater military stability, greater economic stability and steadier employment.

Ten Place Helicopter Crashes in Auto-Landing

Failure to fine tune at the end of an automated approach is blamed for the accident to a Pando ERP helicopter transport helicopter. The nose of the craft was badly damaged. Leander "Red" Bell, test pilot, was killed and a crew member was injured in a near-panic effort to depressure the damaged nose of the craft.

The high rate of descent of a helicopter in an automated mode is considerably higher than a conventional airplane requires the pilot to build up forward speed during his landing approach and to execute a rapid stop just before



HEAVYWEIGHT FIGHTER TAKES THE AIR

First model of Curtiss XP-47, an "Auntie" heavy fighter, is the lightest fighter plane ever built, its empty weight is only 10,000 lb. But, with a 17,000 lb. load, it is as fast as a P-51 Mustang.

touching the ground to slow the landing. Although definite cause of the crash has not yet been determined, it

appears that the pilot either failed, or was prevented from, increasing the collective pitch at the proper moment.

Jet Fuel Shortage Is Big Question

New Army-Navy specifications give hope of ending scarcity, but no results promised for two years.

By STANLEY L. GOLBERT

Look for the tight jet fuel situation to clear up, but not for at least two years. Final new Army-Navy specifications for jet aircraft fuel had a big answer to anticipated shortages under current specifications by promoting greater saving in base fuel characteristics.

But ANAFB (official title of the new specifications) will not be put in actual use for some time, and engine manufacturers are already unhappy.

They are faced with the possibility of saving engines for water doubtfully so that aircraft can operate with fuel having differing characteristics.

Altogether, Curtiss-Wright, Pratt & Whitney, General Electric and Westinghouse are conducting engine experiments with the new fuel.

How much lower new fuels will be compared to unfaded. Current jet fuel yield from a barrel of crude oil is approximately 60 percent. Under the latest specifications, a barrel of crude may yield up to 65 percent.

■ **Characteristics.**—Fuels that meet the new specifications are more readily available because of an increase in the latitude of characteristics which include: ■ **Freezing point.**—Not above -70 degrees F. ■ **Acoustic content.**—Not over 10 percent by volume. ■ **Unfaded specific gravity.**

■ **Kid Vapor Pressure.**—Between 57 and 60 psi. ■ **Temperature.**—Between 415 and 600 degrees F. (at and point) at the 90 percent evaporation point.

While test statistics indicate that jet fuels meeting these specifications will cut all jet engine demands, fuel efficiency of the fuels will require some adjustment in two years and possibly more. Meanwhile, some fuel experts feel that fuels it would be impossible to use all available jet aircraft for an period of two years—jet fuel supplies are too low.

Availability has been the only problem plaguing aircraft fuel resources. A jet fuel more volatile than JP-1 (current jet fuel essentially known) offers advantages of easier storage, lighter weight, less corrosion, efficiency and smaller deposits in some engines. Less volatile fuels offer advantages of freedom from vapor locking and expansion losses. Military requirements require the utilization of very low freezing point.

But jet gallons instead of per pound in becoming the criterion for buying fuel. All other factors being equal, usage of aircraft depends upon that. ■ **Production.**—Producers of a jet fuel problem is the easiest jet fuel situation. The small loads of distillates that from JP-1 are close physically to other oils and is automotive grade.

While changes in the utilization of JP-1—replacing oils either above or below it—have a direct bearing on the production of motor fuels. Distilling the balance of oils to extract one for use in JP-1, for example, can cause the loss of almost three barrels of motor fuels. And motor fuels continue to be the oil manufacturer's greatest source of revenue.

While military demands are possible an extremely high, oil industry experts claim that aircraft jet fuel requirements will be several times greater than aviation gasoline.

Reportedly, industry problems emerging from the new specifications is that during the years 1950-1955. These figures may not necessarily show all the facts about the ANAFB. Full effects of these facts on the design problems of all aircraft.

■ **Conservation.**—Predicting their results in the future, oil resources feel that the commercial jet aircraft, a less volatile fuel will be needed by aircraft because of the increased fuel demand. They doubt that jet engines will be able to utilize heavy distillate fuels such as diesel oil and gas oil because of extremely low temperatures normally encountered, and the problem of designing a light-weight high-output engine to utilize such a fuel.

The aviation gasoline situation is not strictly better fuel—but not by itself. The long drawn-out winter has forced refiners to concentrate on supplying heating oil demands beyond their usual requirements. While gasoline supplies will not adjust that an actual shortage of aviation gasoline exists, they have to let it be known that there is no room for new contracts at the present time. But feeling in that order, aircraft requirements take a sudden upward swing, present contracts will receive all commitments.



CONSTITUTION'S COMMODIOUS COCKPIT

Luckford XR-16's Commodore flight deck shows arrangement of flight controls, instruments and emergency equipment. Pilot and copilot controls and instruments. Flight engineer handles oil, engine, fuel, oil, electrical, fire warning and fire fighting and emergency equipment shown facing right. Flight controls are responsibility of pilot. Unusual features include adjustable instrument panel, and a control panel. Pilot's seat, panel commander's seat of center flight compartment. Much of the equipment shown is flight test instrumentation, especially arranged for recording purposes.

meet the
"flyweight"
champion!...



This 3 kw G-E "flyweight" silicon autotransformer weighs in at only 8 pounds



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light...small...reliable...

These autotransformers are really "flyweights." Once for every G-E "flyweight" silicon delivers more than 3 times the kw of the conventional autotransformer with Class A insulation. They'll carry your load and save space and weight too. Silicon autotransformers won their "title" the hard way. A long service record with the U.S. Army Air Forces furnishes proof of their ruggedness and dependability. On commercial aircraft, too, they are "tops" for operating landing lights and other vital aircraft equipment.

In addition to these silicon units, G-E offers the following major types of standard aircraft transformers:

Bulkheads for fluorescent lighting
Ignition transformers for carburetors, wing de-icers

Ignition transformers for jet engines

General-purpose transformers, single- and three-phase, for lights, instruments and accessories

Phase-changing transformers for gyro instruments

All General Electric aircraft transformers are designed to:

1. Give dependable operation at altitudes up to 50,000 feet.
2. Operate in ambient temperatures from -30 C to 70 C.
3. Tolerate normal frequency variations in power supply.
4. Withstand vibration and shock.
5. Keep weight and size to a minimum.

General Electric facilities and engineering "know-how" are available to help solve your aircraft transformer problems. Contact your nearest G-E sales office, or write **Apparatus Department, General Electric Company, Schenectady 5, N. Y.**

GENERAL ELECTRIC



AVIATION WEEK, March 15, 1948



LINER PRODUCTION FLOW

Aerial photo of Consolidated Vultee plant at Van Nuys, Calif., (above) is superimposed with flow lines showing Consolidated production progress. Parts and small subassemblies are fabricated in Building 4, extensive left. Flow is in Building 1, center foreground, toward of major assembly and testing of aircraft wing section with fuselage. Final assembly starts in Building 1 and moves into Building 2, at right, where interior trim assemblies are manufactured and installed in Building 4, background. Transporters move final sub-assemblies from Building 4 to Building 2, at right, where final assembly of the aircraft is completed. Photo at left (by Ken-Tan) shows overhead of C-47 in varying stages of assembly period just outside Building 2. Flow is out back into Building 1 line as sequence of delivery runs.

Martin Board Elects D. A. Ewalt Treasurer

Donald A. Ewalt, former executive, has been elected treasurer of The Glenn E. Martin Co., Baltimore, and will take over his new duties immediately. Ewalt has served several large custom and medium-sized industrial organizations. He is a specialist in federal and state tax matters and has wide experience in corporate finance. Announcement of his election followed a directors' meeting.

Previous associations include Federal Davidson and Ehrlich, Detroit accounting firm; Vanasco Oil Co., Trenton; Tire and Rubber Co., Akron; Telco, Inc., Muskegon, Pa., and his own consulting firm in New York.

The company also has appointed Neil V. Massaro as 1948 assistant in personnel and public relations and Chas. C. Bell as manager of the service and spare department. Bell joined the company in 1939 as a draftsman, serving as the Mass. and B-26 and war-torn and aircraft design. In 1945 he was made master technical supervisor of the B-26. Ewalt has previously been in charge of 2-4-2 service.

In other personnel activity

Public Atomic Corp. appointed John H. Hoffman, former vice president and treasurer of Western Union, as its president. Hoffman has had extensive general service experience with the company since 1940. Hoffman also served as president of the Public Atomic Corp. in 1940. Hoffman has been in charge of the company's general service since 1940.

Stromberg-Carlson Electric Corp. elected Charles F. Collins, president and treasurer, as its president. Collins has been in charge of the company's general service since 1940. Collins has been in charge of the company's general service since 1940.

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Guide Light To Aid Plane Crash Search

\$28,300,000 to be spent on new equipment to aid high speed flight research.

National Advisory Committee for Aeronautics plans an expansion program calling for \$25,200,000 worth of new research equipment and modifications to existing facilities to increase their speed and capacity. The amount set for this equipment, according to Dr. Hugh L. Dryden, NACA Director of Aeronautical Research, "merely reflects the most technological available and does the international situation." Major projects of the pro-

***Gm Dynamics Laboratory**—An entirely new facility costing \$5,401,100 is located at Langley Field, VA. The laboratory will contain eight major test cells ranging in speed from Mach number 1.2 to Mach number 10, a flow truck to test primary wave propagation, facilities for supersonic compressor research, optical benches for developing low-density flow research instrumentation and equipment for simulating supersonic flow at extremely high altitudes. Principal purpose of this new facility is in the study of low density high velocity flow characteristics in the flight of missiles at 3000 miles per hour at an altitude of approximately 100 miles.

Inductors: Aerodynamics/Lift/losses.—Modernization of this equipment at Langley Field to increase both the quantity of air and the speed and pressure of the induced flow is estimated to cost \$2,600,000. Used to study problems of critical flow in aircraft, new jet engines of greater power and rate of air-fueling stressed greater capacity for air flow.

Flight: Research.—This group, formerly located at Langley Field, is now in effect on flutter phenomena at high speeds, but the tremendous increase in aircraft and missile speeds since the war has increased the need for research aimed its reorientation to provide tunnel air speeds up into the transonic speed range, at which flutter difficulties are already posing acute. New pressure equipment is in use at the Langley

► **Flight Research Laboratory**—Because present hangar facilities at Langley Field are too small to accommodate large aircraft, such as the Boeing B-29 Douglas C-54 and others, the Flight Research Division at the Langley Laboratory plans the erection of a large hangar to cost \$3,600,000. More than a hangar, the building will include numerous shops, offices and sheltered working areas for the construction of aircraft.

search information and other related personnel.

Save It Your Foot High-Speed Tunnel—Originally designed to operate at high axleload speeds, the tunnel has been modified over the past two years to increase its speed into the transverse realm. This increased speed has placed less severe stress and vibration on the tunnel that repeated repairs have been necessary. The NACA (cost \$500,000) worth of modification and re-designing will get the tunnel to accommodate the increased loads. These repairs will save nearly one million dollars over the cost of building an entirely new tunnel, which would require 18 months of construction.

Fastest out High-Speed Tunnel—Due to the heat generated by the high-speed running of the tunnel, special air-cooling apparatus is required. Filter equipment is badly needed since the present absence of such a device admits dirt into the tunnel through the cooling intake which has the effect of sand blasting the models, requiring frequent re-finding of their surfaces. Cooling and filter equipment will cost \$27,000.

★ **Population Sciences Laboratory**—A entirely new facility to be created at the Cleveland Laboratory, this new installation will contain refrigerating equipment capable of reducing the temperature and pressure of air at the rate of 80 lb. per second, more than 140 tons of air an hour! To cost \$10,000,000, this new laboratory will permit the testing of jet engines under conditions approximating an altitude of 35,000 ft.

• **High Energy Pack Laboratory**—Another new facility, this laboratory will cost \$500,000. It will contain equipment for research on new aircraft materials and fuels containing greater energy per gallon than are presently available. Because of the danger in the preparation of such fuels for test, this laboratory will be located at a safe distance from the present research buildings.

► **Air Drier for Superpipe Tunnel**—To ensure the air supply for implosion tunnels must be dry (to prevent condensation shock waves from ruining supercavitating flow patterns), several a-

drying equipment is required. Proper air drying equipment is used alternately for the shingle wood tunnel and the small sapwood branch at the Cleveland Lumber. Because the disc used means idle for a time after becoming saturated with moisture, the two branches cannot be operated continuously. A new air duct, to cost \$225,000, is needed, to provide this continuous operation.

A light which would guide searhens to the sense of an airplane crash has been developed by R. A. Sheilsburger who is now negotiating for its manufacture.

The crash indicator light is egg-shaped, 4 in. in diameter and 12 in. long, and weighs about 4 lb. The main support shaft through the center has a spring to cushion the jolt as the light

The central control light is covered first with sponge rubber, then with a sheet of steel, another coat of sponge rubber and finally a thin stainless steel cover to protect it from exposure. This sheet protection extends to, but does



not cover, a narrow band of plastic around the circumference through which four lights shine. Two of which, it is said, will always be visible. A high strength plastic, resistant to heat and cold, and of whatever color required by the Civil Aeronautics Administration, is used for this light step.

The Los Angeles office of CAA has put the light through preliminary tests which have indicated clear visibility of the sign up to 10,000 ft. Airborne Tests for visibility in brush and other more severe conditions are in progress. CAA has requested the manufacturer to prepare specifications on the light's intensity and full operating data as a first step for further evaluation.

Shelbourn says that there are a number of ways of attaching the lights to an engine wing so that it will be secure under all conditions except the high impact of a crash. He added that aircraft engineers would doubtless improve on the clamping method he had suggested. It has been estimated that the lights can be manufactured for sale at a price of \$75 each.

Meet the Men Who Keep 'Em Flying!

(END OF A SERIES)

The men who design modern aircraft, and the men who direct inspection and maintenance programs for modern airlines, share a common

objective, also like perfection. Designers strive for perfection in creating new, improved aircraft, maintenance directors strive to maintain that perfection. To both groups, the achievement of that objective is based upon meticulous attention to every detail, however trivial.

The OSTUCO Tubing is a universal use of OSTUCO Tubing in modern aircraft is an outstanding example of the importance of details. The inherent strength-weight-out-weight advantage of OSTUCO Aviation Tubing is only one important contribution to the creation of more efficient aircraft. Other details which figure prominently in the choice of OSTUCO Tubing include OSTUCO's continuous research, precision craftsmanship, years of engineering leadership, an amazingly low record of accidents and, finally, prompt delivery of the finest aviation tubing available.

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"Droop Snoot" Configuration Aids Jet Fighter Landings

Leading edge flaps improve lift characteristics of high speed wings for slow approach. Piloting technique is greatly simplified.

By ROBERT McLAUREN

In high speed aircraft, the low drag characteristics of the section are of considerable more importance than the lift, resulting in a progressive decrease in lift coefficients for some aerobically stressed wing plan.

This deficiency has been accommodated by the varied increased speeds of military aircraft, since the lift of a wing varies in the square of the velocity, the loss of the lift coefficient is of only minor consequence within the cruising and high speed ranges of modern aircraft.

The price that must be paid for only low drag section is a usually high take-off and landing speeds, unless a great deal of attention is paid to the development of high lift devices such as slots and flaps. Unfortunately, above a given value of flap chord and deflection angle lies a region of diminishing returns, as that improvements in lift coefficient through flap development does not offer any substantial gain in the future.

► **New Flap Studies**—A promising addition to this aerodynamic research was inaugurated by the German during the war, and W. Kugel carried out wind tunnel tests at Gottingen during 1943-44 on a "nose flap," a hinged section of the wing which could be lowered at the nose at 50 deg. to the chord.

This device performs the same major function of the trailing edge flap—it increases the wing camber and thereby provides a useful increment in the lift coefficient. Further work on "Nose-klopper" design was carried out by H. Kuster of Adenholz and the results of the research became available to this country after V-E Day.

In order to check the German results and, further, to compare the application of a nose flap to a modern high speed aircraft, such as is used as jet fighter craft, the National Advisory Committee for Aeronautics tested two types of nose flaps on an NACA 64-012 airfoil in the two-dimensional low turbulence pressure tunnel at the Langley Memorial Aeronautical Laboratory during the fall of 1946.

These results have been published in TN 1277 and indicate that the lift coefficient of a laminar flow airfoil can be increased as much as 38 percent by

the use of a leading edge flap, and as much as 17 percent with the leading edge flap used in conjunction with a trailing edge flap. This would mean, in a typical example, a 50 percent decrease in landing speed, or a reduction from 100 to 50 mph in the landing speed of a jet fighter, more than half of which is due to attributable to the nose flap.

Research Staff, Messerschmitt effect at the leading edge flap is an increase in the angle of attack at which the maximum lift coefficient is obtained, indicating an increased stall margin both of these measures (a lift coefficient and stalling angle of attack) theoretically result from the action of the nose flap in reducing the magnitude of the pressure peaks and the adverse pressure gradient characteristic conventional airfoil near maximum lift. This is because the nose flap is aligned with the airflow approaching the wing leading edge, resulting in the flap carrying a substantial amount of the lift without the presence of excessive pressure peaks.

The tests indicate, however, that positions of the flap less than the optimum, cause a backwash of the airflow over the air portion of the wing before the angle of attack is great enough for the flap to contribute substantially to the lift. Similarly, excessively great nose flap deflections create large pressure peaks on the leading edge of the flap at low angles of attack. For these reasons, leading edge flap deflections in not set quickly, and preferably be of the two-position type ("up" and "down") to prevent the selection of intermediate positions through error.

► **Pitching Moment Effect**—A criticism of high lift devices is their effect on the pitching moment characteristics of the wing section. The major stability problem created by trailing edge flaps is their creation of a comparatively large negative (nose down) pitching moment requiring tail trim changes by pilot.

Tests indicate, however, that the effect of nose flap extension is relatively small as compared with trailing edge flaps. With nose flaps extended at low lift coefficients, they create negative pitching moments but as the lift coefficient is increased, the nose flap creates positive pitching moments can

responding to a forward movement of the aerodynamic center. This latter follows from the fact that area has been added ahead of normal leading edge.

The behavior indicates that nose flaps should not be extended by pilot until the airplane has slowed to a speed producing the high lift coefficient required for flap extension. Proper coordination of leading and trailing edge flap extension will minimize the adverse pitching moment of the latter and eliminate the trim changes required in conventional aircraft.

Last prediction stretch is further leading edge flaps is the new German VJ-102. Further Navy jet fighter. It features a highly developed nose flap configuration in which the entire wing leading edge is hinged downward for landing and takeoff in contrast to the plate-type panel suggested heretofore.

The German configuration provides higher efficiency than those on which test results have been reported and pitching technique is greatly simplified. This change would be a major factor in the jet fighter's ability to get off a carrier deck, quickly and to come about slowly under perfect control.

Added Weight Eliminates Relay-Contact Rebound

Successful elimination of contact rebound on electromagnetically closed relays has now been accomplished.

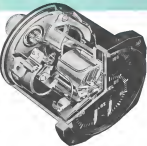
Rebound freezing of contacts due to arcing had long been a major source of failure of this type of work. According to B. D. Aarke, Westinghouse Electric Corp.'s senior engineer at Lima, Ohio, additions of an inertia member to the moving contact bar provides necessary means in the spring pressure at the instant the moving contact bar tends to rebound.

A typical application of an inertia member can be seen in the accompanying illustration. Here, the inertia member takes the form of a circular weight, spring mounted on the contact bar.

This principle has been applied to a number of aviation contacts, resulting in the elimination of contact freezing from rebounding.



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Sync-Kid system of rotor blade alignment developed by Bell Aircraft Corp. and used by New England Helicopter Service. Use of two squares and timing observations accuracy of revolving rotor hub, tail indicator, level, and protractor. Alignment is attained by tracking string at the center of gravity position on each blade so that it points over the previously scored point on rotor hub.

'Copters Checked In Service Role

Commercial "case-history" discloses needed refinements.

Engineer-operator team vital for design improvement.

Though great strides have already been made in stretching helicopter overhead periods, more work—but important—design problems must be solved before rotors can be economically re-used a wide commercial sale.

There's a second reason. These craft have one vital factor in common with other types of aircraft—take experience and a running operation to learn how they can be improved and to iron out the "bugs" that inevitably appear. This has been true of every aircraft ever designed.

The real problem are the operators who learn these things the hard way. And by way of the usual sub-clerked with localities and they help New England Helicopter Service, of Halls Grove, R.I., has contributed a big share of the helicopter know-how that exists today.

NHHS completed a year of operation in January. So far there has been more red ink than black on the company ledger, but things are looking up. President Leon W. Plympton, Jr., says good profits are ahead, claims little credit for solving the big problems of the first year. Key men behind the scenes is his chief mechanic—London Cooley.

► **Maintenance Coordination.**—Cooley reports big advances in the past 12 months. Most of the credit for this, he gives willingly to service engineers at the Bell

Aircraft Corp., who from the beginning have taken every suggestion seriously and have always tried to improve their commercial helicopter.

Maintenance costs, still high, are far lower than they were a year ago, when NHHS went into business with one of the first Bell helicopters sold to a private operator.

Cooley points first to the improvement in landings procedures. In the beginning there was a complete tear-down of the main flight components every 50 hours—a procedure that was due to the fact that even Bell's experts were not sure how long these parts would stand up under the stress of commercial service.

Today, a major overhaul is necessary only after 100 hr of operation, with minor overhauls at 50-hour intervals. Thus, to Cooley, is the major advance of the initial year. He looks forward confidently to the time when major work will be necessary only every 600 hours—with servicing cuts in costs for parts and labor.

Main job, aside from landings and reasonably few repairs in progress of having key parts Magnaflooded at Ziegler to detect stress and evidence of possible fatigue fractures.

The 100-hr minor overhaul's credit almost as reputation and are held mainly to pack grease at points of wear. And even that is on the way out.

Bell has developed a kit which will make it possible to grease the machine without a landings. These fittings may be added to such assemblies as the main rotor grips, stabilizer bar cone, tail rotor universal joint, and control drive.

On the main rotor hub alone these means extension of the overhaul time by several hundred hours.

► **Design Improvements.**—Further improvements lie ahead as Bell perfects gear fittings for the swashplate control (swashplate plate) and tail rotor system. Approval of the Civil Aeronautics Administration is needed for these things before they can be adopted. When complete, the gearing system will involve only 12 fittings—6 in the rotor head, 4 at the swashplate, and 2 in the tail rotor—a short routine for a mechanic.

Cooley also reports that Bell experts are working hard to improve the universal (swash) angle of the main rotor. A new design is expected to eliminate shimming procedures now used to center the hub. This would cut out a slow and tedious job faced by helicopter mechanics.

And also on the way are improved bearings which would have indefinite life at points of heavy wear in the transmission and at thrust points for the main rotor.

Rating of the main rotor has been



of the **NEW** Marquette model 3V wiper



This new wiper embodies every desirable and practical feature that has been developed in our ten years of experience, covering thousands of installations on military, naval and commercial aircraft.

- ✓ Blades are synchronized at all times.
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Clamp, showing methods pressing strong down to twisted part on nut, pressing next hole alignment. Torque method not slow, with large torque for nut.

made easier with a new blade that can be balanced easily without the addition of wood shims, thereby permitting use on varying weights.

Bell also is reported to be making progress on the development of variable blades. This is an improvement already announced for the new Sikorsky S-62, two-engine model of United Aircraft's helicopter recently placed on the market.

Cresley says that in the first 700 hr of operating a Bell rotorcraft, mostly for student instruction, which is obviously single, no fatigue trouble was experienced. The early helicopters did have a tendency to shed their paint, but this, too, has been improved.

There are several other observations based on the experience of NEHS and its members.

The original Bell rotorcraft installation was such, but a stronger one has been proposed that is entirely satisfactory. There is no longer any need for a

battery can to start the helicopter.

Improvements in rotor controls permit changes to rig both rotor blades and stabilizer bar, making it now possible to do a fixer-kill kind job in five minutes. Flight plans have been provided for setting up the tail rotor gear box and main transmission.

Many special tools still are necessary, but most of them can be made in a handy shop. The Bell firm willingly gives all specifications for them. Special tools are vital because in many parts are made of aluminum, easily damaged by the wrong tool.

Improvements Still Needed—There are some things Cresley feels could be improved further and he throws them out as a challenge to helicopter designers.

The main rotor should be provided with a brake. In a land wheel it is difficult to stop the rotor by grabbing the blades and stabilizer bar as they turn.

Windshield wipers are needed. And detent on the axle.

The reversible control could be improved. It causes a "heavy stick" in flying the "wings" under some conditions, and is difficult to adjust. A single error can cause damage bringing a \$90 cost for replacement parts.

An improved tail rotor design is needed to prevent the blades from twisting in pull out where they are bolted to the hub. As present, the bolt holes tend to become elongated with the stress of flying, necessitating replacement of the blades. These blades were replaced three times in 700 hr of operation.

Cresley feels that the Bell stabilizer could be improved by moving the rear wheels forward. Now, when a student pilot lands with the tail a little low the ship pitches forward suddenly as contact with the ground. This puts unusual strain on the rotor head and may

break a dynamic stop cable, or both of these. They cost \$9 each to replace. While it does not bother the seasoned pilot, the extreme sensitivity of the throttle is another drawback. It makes it hard for a student pilot to adapt the tips of the machine, and during flight, novices have a tendency to over-rev to overcome the engine.

On the basis of NEHS' experience it appears that maintenance as a job might be far more exciting than on a conventional aircraft. The many alignment points are partly to blame for this. Time and again the regulations from aluminum threaded into aluminum, a situation that calls for extreme care in assembly. A maintenance who feels he is only splicing threads a slight slip on a bolt can bring a job for \$70 in repairs damaged parts.

The machine also would be useful where he has these parts when training down the helicopter for a check.

NEHS operates its Bell machine about 25 hr every three days, keeping an eye on changes on the engine at that interval. Cresley feels that it is not a full-time to change the oil with a part job of cleaning the air strainer. He is convinced that a more simple system could be provided.

Leon W. Roughton Jr., the man who gave the Bell to the New England Helicopter Service, President of the firm and agent of choice, he finds these things true about his expensive ledger.

In 1960 he is flying Bell helicopters he has laid out about \$7,200 for maintenance and spare parts in addition to paying a full-time instructor.

In 5 yr he will spend about 90 percent of the total \$25,800 cost of the machine in replacements.

A helicopter operated 100 hr a year for 5 yr would require \$15,600 for replacements. One-quarter of that would be spent on the engine.

Ency 100 is a new thrust bearing cost \$21.

Ency 200 for new assembly which limits the engine to the stream-air-cooled phase \$20.

A bolt, slightly off standard, costs \$5.

Enough for the transmission—12 bolts every \$90 to cost \$137.50.

The question on the lips of the helicopter operator—and the challenge to the designer—is Can this machine be run using more standard aircraft parts?

New Light Metals Being Produced

Two new light metal-bismuth and aluminum-bismuth alloys are now in experimental production at government pilot plants. Both show great promise for use in aviation.

However, both are heavy and brittle as though an unalloyed low-carbon steel, a less than twice the weight of aluminum, and is twice as strong per cross-section. In addition to its strength, the new metal is not affected by salt water as salt steel, and is very resistant to other corrosion. Because of the resistance to salt water, the navy is now experimenting with pistons, valves and wing cross-sections of aluminum.

Steel Corporation—Aluminum, about 10% lighter than steel, is expected to compete with stainless steel, titanium and Inconel, particularly in turbine blades. Its corrosion resistance properties combined with high strength make it a natural for turbines. Corrosion has been one of the hardest problems to solve in the turbine field.

The two alloys recently have been produced in pure aluminum quantities. U. S. Bureau of Mines now can turn out 100 pounds of bismuth and 65 pounds of aluminum a day. Titanium pilot plant is located at Boulder City, Nev., the aluminum plant at Alcoa, Ala. The Boulder City plant will be expanded to a capacity of one ton a day, final production, this year.

Production Costs—Production costs of the new alloys are a good deal higher than aluminum, but are comparable to the price of steel.

Bureau is doing out simple trials of bismuth in industry, education, and government research institutions, and the Navy under cooperative research agreements where, say, development on use of the metal are encouraged. Studies of use of the metal in structures, devices, springs, hard-surface materials, pistons, valves and wing coverings for airplanes are being carried out at present by the cooperating agencies.

Experimentation with aluminum is about a year behind that of bismuth, but metallurgists already are confident that it eventually will replace other materials in such fields as corrosion-resistant vessels, turbines and in many.

Since aluminum has developed the role of thumb that an alloy of a metal is always better than the metal itself, such developments with these metals, still untamed, should be revolutionary.

AVIATION WEEK, March 25, 1960

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HYDRAULIC DEVELOPMENTS

Atomic Hydrogen Welding

The shells for most spherical hydraulic pressure accumulators have been made by joining two hemispheres with a ring of series of bolts at their equator. This method of fabrication, however, needed to increase the loading stresses on the shell and added to the danger of fragmentation under gunfire. In the design of pressure vessels for military ac-

craft, these factors are of primary importance.

In an effort to develop an accumulator shell which would be more satisfactory from standpoints of both stress and fragmentation, the Pacific Division of Bendix Aviation Corporation characterized the joint as the equator through continuously joining the two hemi-

spheres by means of Atomic Hydrogen Welding, which also, incidentally, has the effect of greatly reducing the weight of the accumulator.

The principles of this method of welding are as follows: An arc is struck between two tungsten electrodes which are held close to the work. Gaseous hydrogen flows through the path of the arc from openings in the electrodes. The temperature of the arc breaks molecular hydrogen down into atomic form, and nascent hydrogen, escaping from the arc and approaching the relatively cool metal of the shell, accumulates and retains the heat absorbed in the arc accomplishing the weld. The temperature gradient across the weld zone is less severe than with other methods, and the hydrogen acts as a powerful reducing agent which, by excluding oxygen, helps to preserve the original properties of the metal.



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NEW AVIATION PRODUCTS

Small Pione Midget Autopilot

New automatic pilot, outgrowth of successful tank gas stabilizer and weighing but 35 lb., is announced by Westinghouse Research Laboratories.



306 Fourth Ave., Box 1007, Pittsburgh 30, Pa. Application is expected to be for light commercial and general planes as well as military aircraft, and possibly guided missiles. Designated Cypselus, device takes positive control of plane even throughout loop or barrel rolls. Unit's three gyro respond to changes in angular velocity in location of aircraft, and state they are fixed to plane rather than maintaining set position as with most, they cannot transfer to new control position of aircraft as they are.

Insulated Antenna Feedings

Designed to minimize precipitation static interference caused by corona discharges during bad weather are aircraft radio antenna fittings offered by Franklin Electric, Inc., North Conamond, N.Y. Shield, stainless, corrosion study, and 1-in. copper can be quickly installed in special without tedious gluing or taping. Streamlined insulated fiberglass mast is suitable for other electrical or feed-through applications. Deadend mast terminates antenna wire close completely insulated self-locking connector and provides take up element to remove tension. Feed through mast permits insulated antenna wire to pass through mast into aircraft without external connection. Durable polystyrene lens and fiberglass construction of antenna is intended to assure long trouble-free life.

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Gate valve, suitable as shutoff in fuel, engine oil, and hydraulic oil systems at 14-in. water-operated 28-in. d.i., weighs but 2 lb. and which operates, open or closed, in 1 sec at pressures up to 300 psi. "G" ring seals are replaceable in removing two snap rings. Electrical portion of device is supplied in self-contained package can siting of motor, limit switches, solenoid, and wiring, mounted on cover plate, and can be replaced without the necessity of using hose bracket or attaching lines, by removing five screws. No additional adjustment is necessary after placing electrical package in position on valve. Males a Hydro-Aze, Inc., 3008 Whittier Ave., Berkeley, Calif.



Telemetering Amplifier

For low level signals in telemetering, Marzocchi & Moore, Inc., Bridgeport 3, Conn., announces a C amplifier, model No. 145A72. Utilizing Marzocchi balance principle, unit has time constant of .01 sec and is equipped with adjustable gain setting of 10 to 200. Maximum input voltage is 5v., output voltage 0 to 5v. Power required is 5w. Size is 4 1/2 in. x 3 1/2 in. x 1 1/2 in. In general, unit is designed to be used in conjunction with other electronic equipment, solenoids and shock, isolated as accordance with standard practices. With limited changes, device can be used to drive an indicator for control circuits, or as high impedance d.c. ratio.



Simplifies Engineering Drawings

Control for design engineers and draftsmen, drawing aid, known as Radon Master No. 76, is intended to present rapid, accurate execution of lines. Made by Rapidograph, Inc., P.O. Box 292, Glendale, Calif., device eliminates trial and error method, with reds point automatically and precisely located by center hole serving pointer device. Plastic 9.50 template is 4 1/2 x



9 1/2 in., scale on inner contour runs up to 37/32 in. on 32nd increments, and scales and index points are printed on negative side to prevent wear. Device is stated to be precision-cut from 350 mathematical quality material.

For Instrument Labs, Towers

Sensitive needle valve (512 units) made by Ideal Laboratory Tool Supply Co., Chenequa, Wis., is offered as particularly suitable for use in aircraft instrument testing, providing extremely close control required in adjustment, speed, or rate-of-change checking. Valve unit opening is .001 in., and 20 turns of needle are required to completely open or close. Valve seat runs approximately 1 in. ft. or per turn at 15 lb. differential, in valve-open position. Pencil marking device, cut integrally with body, can also be used in marking instrument, with only 1 turn of needle passing through to head. Designed by case company, Model 1078 automatic indicating barometer (the control lever, weather station, instrument repair and tool shop) is intended to eliminate possibility of pressure error and difference between readings taken by various operators. Device features large dialing column, precision beam glass taper, bistochastic pressure reading act on straight reading scale, so that sensitivity of an inch, temperature control in close limits, control drive motor, and electronic amplifier and control housed in suitable cabinet.

high intensity approach and runway lights

*Thousands in use
all over the world*

*Thousands
more in
production*



Assembling does not require a CMake function call.

Part of the production line showing units completed, units for docking.

Focusing department. With photoelectric tests, light rays are checked, and permanently adjusted.

L-M-Series high intensity approach and runway lighting systems have been tested and provided actual operation for more than ten years. A high degree of recognition and acceptance has been granted by airlines, pilots, airport operators, the armed forces, and official agencies.

During the war thousands of these lights were installed strategically up and down—Naval forces, Alaska and the Aleutians—and in the far-flung islands of the Pacific. Many of these lights—plus new ones—are now in regular use and today, thousands of the new E-M-Berline beam

protected suits are mailed, or are ordered and waiting all the airport is ready for them. These new suits have up to 380,000 microfibers—farther than four times the output of the E-6000 suits used so successfully during the war.

Get the details on these glow-free lights that do so much to improve safety and put us transportation on number schedules. For information on this and other L-3 electrical equipment for large and small airports, write Linc Material Company, Airport Lighting Division, East Stroudsburg, Pennsylvania.



How to Control a Light Beam— and Why
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1. Clear weather. Hole path of apex height seen along the looking path.



2. Redwood slatting—big, dead, warm. The pillars
are I can the hollows that I reach this.



3 Increased Brightness: Not the brightest of our most common fog, snow, etc., but the difference is noticeable, and perceptibly, but there's just slightly according to Alfred's law.



14. **Ex...** with 1 M. In our lights... Brown director is corrected. The government just says a pointer to the day or night visibility the weatherman gives him. The simple synchronous meters—the not-moving part is the wall—automatically 'turn it' the beam to the correct angle. Light

Easy to operate—even though the explanation may sound complicated. Better get the whole story—complete with diagrams—in the brochure, "The Lighter that Runs on It." Write: Line Material Company, Airport Lighting Division, East Windsorburg, Penn.

Pilot in a fog?

bring him in ... on "contact" ...
with fully controllable beam

L-M-Bartow
high intensity
approach and runway
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Any high intensity lights are better than the old type—but you can still make glare, and get much more effect

It takes experience to know those things, and a knowledge of what the pilot must see when he runs off instead

ments and onto portast. And it takes skill and engineering ability to work out the problems.

The flyer-engineers and lighting experts of Barlow Beacon, Inc. and Luss Material Company have the ability and experience. L-M-Barlow lights, developed some years ago, were proved, and improved, during and since the war. Today more than 30 installations are in operation, dozens more on order, in U. S. and foreign countries.

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LINE MATERIAL Airport Lighting



Overgrown Aircraft Industry Pining for Procurement Boost

Backlog concentration and too much space underline need for "insurance premiums" noted in Air Policy Board report from Capitol Hill.

One inescapable conclusion from the report of the Congressional Aeronautics Policy Board (Aeronautics News, March 31) is that only a substantial increase in aircraft procurement will ease most of the industry's ailments.

The industry, in a whole, is housed under too large a roof to sustain operations profitable at current levels of production and research. Maintenance expenditures are piling a heavy drain on working cash resources of a company whose physical facilities remain idle. "What the country is aggregating in the aircraft industry is estimated at approximately \$3.9 billion, there is an uneven distribution of these orders among companies.

► **Backlog Concentration**—The concentrated nature of aircraft backlog is manifested by the distribution of post order in 1954, the industry was dominated by five companies which accounted for 55.2 percent of the total order. These were Consolidated-Vultures, United Aircraft, Douglas and Martin. In 1947, the distribution, while more widely diffused, was still relatively concentrated with the four largest units accounting for 55.6 percent of the industry's total orders. The new line-up, however, changed slightly, with Lockheed replacing Martin among the first four. Promised as recently reported backlog, it is probable that further elongation in the billing of the first four units in the industry will take place in 1948.

Even with the implementation of Plan "A", cited by the Policy Board, total aircraft procurement requirements would be equivalent to about 111 million hours annually, well within the confines of the physical capacities of the industry.

► **Facilities Misused**—The present plant facilities of the industry can be measured. At peak levels during the war, "military" aircraft production was at the rate of 9 to 10 per sq ft per year. It is a matter of public record that the present output from most of the aircraft factories is less than one-third the military maximum of 4,000,000 units. At 9 to 10 per sq ft per year, this area should

be capable of supporting a peak output of 100,000,000 aircraft in 10 years, under full wartime conditions.

Plants now held in reserve have a total area of 21,200,000 sq. ft. Applying the same measure, they should support an additional 101,000,000 aircraft in 10 years without modification. Accordingly, it appears that the potential industry peak wartime capacity under conditions such as obtained in 1944 and without allowance for the contribution of the personal plane units is approximately 200,000,000 in all aircraft per year.

Aeronautical sources indicate that plants now producing plans can be converted readily to production of guided missiles.

► **No Place**—The board made no place for marginal aircraft production in its The President's Air Policy Commission. Among other things, the board stated: "Obviously, companies will go through hard periods. Eventually, some may be forced out of business. These casualties are an inescapable result of competition. The losses they entail are justified by overall benefits of the program."

In an effort to relieve excess plant facilities and maintain organization per unit as a number of aircraft companies attempted ventures into non-aeronautical fields. Almost without exception, this diversification has been a most unprofitable experience, containing substantial losses. For the most part, such diversions were largely financed by checkbook loans.

► **Industry Position**—Aircraft builders are in an inferior position to compete with established companies in the consumer field, materials those with an attached outlet. It is a fact to note that, if successful, non-aeronautical ventures could have lessened the dependence and hence the burden on aircraft procurement.

Discussions of consolidation or merger as a means of combining the industry frequently appear. A few years ago a merger of Consolidated-Vultures with Lockheed was in the advanced

discussion stage only to be kept by a ruling by the Justice Department. It is not generally realized, but under the law, where a combine of such two companies would have such a concentrated position in the industry, the Attorney General had no alternative but to take against this proposal.

While certain mergers remained, however, fewer but far stronger aircraft companies would evolve. The cost of the ultimate contraction of the industry desirable from the economic standpoint of both number and use of facilities is extremely difficult to ascertain. Inherent safeguards would be necessary at all times, of course, to assure the military services of at least two competitive sources of supply for the war product.

This process would be nothing more than the evolution of a healthier, more aggressively competitive aircraft industry capable of living as a result of its own efforts. This is a course that would follow in the well-trodden process of a sound manufacturing industry which had over-expanded.

► **The Industry's Place**—The aircraft industry, however, occupies a very special place in the American economy today. In a national emergency, the industry may be considered part of the military establishment of the United States. Of equal importance, the industry has experienced no "normal" production levels comparable with those prevailing for most standard enterprises.

While it is true that there are many economic factors surrounding the aircraft industry today, many of these may be considered a form of "insurance" in a period of uncertain world conditions. The present apparent excess capacities of the aircraft facilities could be used as part of the broad platform for rapid expansion in time of emergency. Moreover, the industry has the best war record obtained until 45 months after the program was started. In event of another crisis, all available production facilities again will be needed. Aircraft plants represent a substantial part of the nation's present military production capacity.

The cost of maintaining the aircraft industry at its present size beyond economic boundaries may be considered as a "variance premium" to eliminate substantial capital outlay in times of emergency.

The Board evidently sought to meet this problem by recommending that the armed services contract for the maintenance of standby facilities promptly owned by the aircraft industry. The proper principle is procurement agencies would contract with the manufacturer to keep excess facilities ready.

—Selig Abraham

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AVIATION WEEK, March 25, 1948

37



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AVIATION WEEK, March 15, 1948

SALES & SERVICE

Fixed Base Operators Dispute Training Claims of Budget Bureau

Balfour of Spartan cites job opportunities for pilots; Congressional sentiment growing to retain Veterans Administration flight training.

Aviation groups are beginning to make their weight felt in Congressional hearings on the continuance of flight training.

They have put forth a barrage of facts and figures aimed at winning the Veterans Administration's claim that the bulk of flight training serves no useful purpose. As a result, some members of Congress are favoring a continuance of screen flight training on pretty much its present basis.

Cohen asks to limit it to purely vocational flight training. However, no

proper definition of purely vocational training has been offered.

► **Groups Divided**—Aviation groups appear divided on whether CAA should take over GI training, or whether it should continue under VA supervision but be issued to show some group of aviation's special problems. National Aviation Trainee Association has advocated taking the training program over to CAA. United Pilots & Mechanics Association calls this proposal unwarranted. It claims it would substantially increase cost of these centers to the government

by requiring additional CAA personnel.

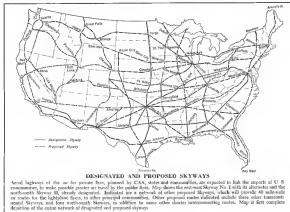
Rep Joe L. Evans (D. Tex.) has announced that he is preparing to offer a joint resolution asking that flight training be another matter to be decided. This would contradict the Veterans Administration's stand.

► **Training Costs**—Two points made in testimony and briefs submitted to the House Subcommittee on Veterans' education, training and rehabilitation are seen as the strongest substance offered yet in figures quoted by the Bureau of the Budget. (Aviation Week, Mar. 1).

The Bureau's exhibit noted enrollment in 335,506 flight courses to Nov. 1, 1947. No indication was given that a single veteran who gets an aviation pilot's rating has taken four courses, a return with an aviator's rating has taken three, a commercial pilot has taken two, and that a pilot with instrument rating has taken one.

Elimination of duplications is an excellent aim in half the Budget Bureau's estimate of total veteran enrollment in flight courses.

Information drawn from the Bureau report that the 84,760 veterans who completed private pilot courses with-



out going on to advanced courses would then have to be pointed out, however, that the veteran can use his plane in business travel or for many other useful purposes. A private flying license is all he needs unless he is flying his airplane for hire.

Barclay are drawn between the private pilot's license and an ordinary driver's license (which is all most businessmen need) to operate their automobiles and between the commercial pilot's license and the commercial chauffeur's license required of taxi drivers, bus drivers, etc.

► **Buller's Speeches**—Capt. Max Buller, head of Spartan School of Aeronautics, Tulsa, and president of Aeronautical Training Society, cited in the convention has shared a record of flight record statistics. His records dispute Budget Bureau's claim that there is no aviation employment opportunity for more than 60% of veterans graduating from advanced flight courses.

Barlow reported that at the time he was speaking there were eight or ten employment requests on his desk for pilots with high ratings. His sons graduated at his school "there is an employment problem," he said.

Movement to establish a national federation of associations representing private schools, and including aviation schools along with other established

technical, business and vocational schools is expected to bring about a larger representation of the private schools before the Veterans Administration.

► **Private School Group**—Preliminary meeting of representatives of organizations of private schools was scheduled last week in Washington. It is estimated that more than 10 percent of the total school enrollment in the U. S. is contained in such schools.

Barlow hearings have disclosed that the Veterans Administration's special advisory committee on vocational rehabilitation and training has no representation from the private schools, but to make up for representatives of public educational institutions, and VA staff representatives.

The private school question posed not that their failure to be represented in this advisory group may be one reason for the VA's critical attitude toward training in virtually all private business and vocational and aviation schools.

Aeronautical Training Society, representing many of the large aviation schools in the nation, and National Aviation Trainer Association, representing a wide range of field line operations, none of them with flight schools, were among other groups participating in the preliminary meeting in Washington.

New Funk Customaire Will Sell for \$3495

Paul Aircraft Co., of Coffeyville, Kan., will offer a new 1945 biplane model called the Customaire at a price of \$3495 factory direct.

The Customaire features precision Paul construction patterns of high-wing monoplane with steel tubing and fabric covering and fabric covered wings.

Principal changes are in the cabin where the floor boards have been lowered to provide more leg room. Instrument panel has been redesigned to allow installation of additional flight instruments. Cabin is completely enclosed.

Customaire Specifications

Span (w/ flaps)	35 feet
Length	23 ft. 1 in.
Height	6 ft. 1 in.
Crew weight	1150 lb.
Landing weight	960 lb.
Wing loading	5 lb./sq. ft.
Fuel capacity	22 gal.
Cruising speed (75% hp.)	100 mph.
Top speed (115 hp.)	115 mph.
Utility load	600 lb.
Stalling speed	37 mph.
Range fully loaded	300 mi.
Service ceiling	15,000 ft.
Rate of climb	800 ft./min.



Paul Aircraft Co. of Coffeyville, Kan. has a new 1945 model which will sell at \$3495. Ground photo shows the new streamlined

cockpit and general features of the new model and fabric construction. Instrument panel has been redesigned for safety.

Cessna Certified

The new Cessna 170 was re-certified by CAA last week, with deliveries to dealers scheduled to begin before the end of March. Price will be \$5475 factory direct with a production quota of 350 scheduled by July 1.

Powered by a flat six 145 hp Continental engine, the latest Cessna four-place is expected to be a strong contender in the spring inter competition anticipated by "buddy" planes.

Skynote Gets Lease On Milwaukee Airstrip

The Milwaukee County Council has approved a 10-year lease on Mottland airport to Skynote Aviation Management Corp., of Chicago, which will pay the city five percent of its gross receipts until a new, land surface runway is completed. After that the corporation will continue to pay the percentage, or \$5000 annual rent, whichever is greater. The city also will get two cents a gallon on all gas, and five cents a gallon on all oil sold at the field.

Soaring Contest at Elmira

The 15th National Soaring Contest, first since the end of the war, will take place June 30-July 11 at Elmira, N. Y.

Paul Schwenke, vice president and general manager of Schwenke Aircraft Co., has been appointed contest director, and Bob Taylor, former head of Air Army's glider pilot school, manager of operations.

Sponsors ask that inquiries be directed to Contest Headquarters, 15th National Soaring Contest, Federation Building, Elmira, N. Y.

Minnesota Conference

A statewide aviation and airport management conference, sponsored jointly by the University of Minnesota, the League of Minnesota Municipalities and the State Department of Aeronautics, is scheduled April 28-31 in Minneapolis.

Chairman of this third annual conference is Walter Walcott, head of the Remond-Cross-Wing Country Airport Commission.

NFS Student Rally

National Flight Service plans a mass flight of its students to a centrally located vacation spot over the week-end of July 4 according to NFS President Dick Kessel. The estimated 1500 light planes will participate in the rally. Location of the rally point has not yet been determined.

BRIEFING FOR DEALERS & DISTRIBUTORS

NASTY OLD FLORIDA WEATHER—Even in sunny Florida the Gulf has opened up some fierce weather battles. A personal visit around to three of the principal private fly-in bases in the Miami area last week found only hangar flying on the day of our call. It was all because of a breeze which had reached a velocity of 47 mph, the day before and was still whipping across the fields in a way which discouraged anything less than professional pilots or two-engine aircraft from taking the air.

ILL. WIND—However, the wind made it possible to do street talking in the operations, which probably would not have fitted into a busy day schedule. Dick Flynn provided a 52 hour of the Miami Aviation Center and then returned later to give us a look at his big Ops Locka Airport recently taken over by the city of Miami from the Navy, and the many north airport.

TRANSIENTS VS. HOMEOWNERS—Transient aircraft business is fine during the big winter season, Flynn reports, with about 25 to 50 steady customers who locate south in the planes and stable them at the Miami Aviation Center. But he is getting discouraged about selling their airplanes. He builds them up as the Beach Breeze, and about the time the deal is closed, they remember the airport location, and decide to buy from him. A large percentage of sales is made to the beachfront folk of the Dade County area. Flynn recently made a tally of light airplanes in the county by calling the other airports and discovered that there are 20 Encosperes, far more than any other two-place make of plane, and in Dade County, more than any other two-place. Since the Miami Aviation Center was until recently Encosper distributor and is still an Encosper dealer and since it is the Beachfront distributor, these figures make that airport look pretty good from a sales standpoint comparatively speaking.

CUSTOMER SERVICE—A registration form for transient aircraft used at Miami Aviation Center consists of an envelope about 3 by 5 in. which contains a carbon and a card. On one side of the envelope and on one side of the card is a form for registration data on plane and owner, including plane type and number, owner's permanent and Miami addresses, services required and special instructions. On the other side is a form for billing for the services. The attendant fills out the registration and charges section and the carbon and the card, and a study to do the billing. When the bill is completed the customer gets the card and the airport keeps the envelope in the customer file. A yellow "follow-up" card which needs newowner planes on arrival, close restaurants, a business restaurant and tourist cabins on the airport are other services available to the visitor.

RESIDENCE HANGAR—On the airport also is the first of what is hoped will be a series of residences with individual hangars built on them. One corner of the hangar forms a patio for the house and the other corner forms a utility room. The house itself is modernistic with screening and windows as arranged that virtually the whole side of the house can be opened to breezes from Biscayne Bay.

OPA LOCKA FIELD—It is generally reported to run out of runway at Opa Locka, the big double field now administratively owned. Embury Riddle has moved his school operation there from Chapman Field, which city officials turned out of aviation, possibly to encourage the move to Opa Locka. It Embury Riddle isn't moving too much for the hour, it looks like a good switch. The flight school had 2000 ft. of flying in February, which is quite a lot of school flying. The arrangement also includes a big barn-like type building which provides housing for the students.

SWITVEL-GEAR CESSNA—Jack Case, Cessna dealer who operates at Opa Locka, told us he was planning to order the new Goodspeed model looking great about for his four-place Cessna 170. Overcome further, he added that he didn't have the model 170 yet, but that he was due to get his first Goodspeed in April. "I think maybe those Goodspeed wheels will work up some extra interest around here," he said and Flynn began to discuss a demonstration which might be arranged out of the Miami Aviation Center. Goodspeed, which wouldn't be missed at Opa Locka but there are conditions when they would be an advantage at the Miami Aviation Center.

—ALEXANDER M. SURELY

Freight Rates Moving Upward As Rising Costs Hit Cargo Lines

Stick planning to adjust tariffs; other independents may follow suit, but certificated carriers show no inclination to set pending results of CAB investigation.

By CHARLES ADAMS

Airfreight rates, which have lagged the postwar inflation spiral for more than two years, are pointing upward.

Rising costs of gasoline, oil, wages and parts, which forced the independent carriers to institute two-ton per passenger fuel increases last year, have led the independent cargo lines here to raise their independent cargo line rates since fall. One carrier estimates its costs have jumped 24 percent in the last 90 days.

■ **New Ship-Tail-Shift.** Airways, long set U.S. cargo carrier during the past two years, plans to boost its charges between two and three cents a ton mile, making its average revenue about 15 cents a ton mile. Since late fall, Sky's gasoline costs alone have risen sufficiently to add about one-half cent a ton mile to operating expenses.

Other certificated cargo lines—of these far less able to shed deficit operations than Sky—also expected to institute higher rates. But the certificated carriers have shown no inclination to raise charges despite advances in some airfare categories that cargo profits are now low.

■ **UAL Moves.** Significantly, United Air Lines says that month that a tariff replacement with CAB which would raise its freight rates about 15 percent on certain commodities from West Coast cities to three Eastern points from which the Eastern would apply include agricultural products, aircraft parts, wearing apparel, auto mobile parts, drugs, electrical appliances, films and radio parts.

Last September and October, Sky and other uncertificated cargo carriers moved into the black after airlines deficits dating back to the bare fuel operations began. Sky's costs in October were 12.11 cents a ton mile, and revenues were 15.67 cents a ton mile.

■ **Local Fuel Hike.** Since its load factor in October was 99 percent, Sky had little chance of increasing revenue per ton mile by loading loads. Budgetary cuts have become the only answer to rising costs.

Sky has high hopes of cutting ton mile costs in the future with the help of new and larger equipment on its transcontinental route. Should CAB over its exemption to the freight law under the Railway Express Agency authorizing them to do business with certificated cargo lines on a common carrier basis, Sky would consider it a great light for its expansion plans.

■ **New Planes Expected.** The carrier has been making detailed studies of the Boeing Stratajet and cargo versions of the DC-6 and Constellation. If the freight law under the RLA is anything in effect, Sky may buy three Stratajets at three Constellations.

Recent question mark to Sky, and other all-cargo carriers in the fate of their certificate applications in CAB's pending airfreight route map. Hearings

in the proceeding was delayed more than a year ago, but an examiner's report has not been issued. It is expected shortly.

■ **East Coast.** Several of the applicants in the airfreight route map have gone bankrupt since the hearings, and others are now partially liquidated—consuming their capital pending the CAB decision. U.S. Airways, St. Johnsburg, Fla., one of the nation's best-known cargo lines, suspended flights late last fall and has sold a large part of its fleet of DC-3's.

As a result of testimony at the rate investigation hearings last month, it is expected that CAB will place more load of four under freight rates. The floor would lift the maximum of last fall, which ranged down to 10 cents a ton mile.

■ **Cost Allocation.** During hearings on the rate investigation, the Air Freight Association contended that it with the certificated carriers between 35 and 40 cents a ton mile to carry freight on an allocated cost basis. In contrast, average freight revenues reported by the three large certificated carriers last October were: American 22.85 cents a ton mile; United 19.40 cents a ton mile; and TWA 21.32 cents a ton mile.

Bonell Airways contended that its freight operations have cost between 35 and 40 cents a ton mile on an allocated cost basis. Bonell says a substantial loss. But an "alleged cost" or "cost of goods" basis. Bonell and its freight expenses were only about 5 cents a ton mile, so that freight from this third point yielded a profit.



THREATENED IN FLIGHT

One of the first flight photos of the Bonnell Stratajet, twin-prop turboprop plane now undergoing CAB tests. Powered by two Continental 125 hp engines, its cruising speed is said to be 194 mph. Further propeller installation awaiting official certified delivery from the cockpit. (Boeing Company photo)

Domestic Carriers Reinstate DC-6s

Resumption of domestic service with modified DC-6s is slated to begin next week on American Airlines' transcontinental links (Aviation Week, Feb. 16).

United Air Lines is scheduled to reinstate DC-6s on its San Francisco-Honolulu route May 31 and on its domestic apron on Apr. 1 National plan's suspension of DC-6 operations between New York and Miami on May 31, and Bonnell's route date will be announced early in April.

■ **FAA Delivery.** Full restoration of domestic DC-6 service is expected by mid-Spring. Pan American Airways is slated to take delivery on at least two modified

DC-6s (for use by Pan Am) next month. Nearly seven DC-6s were grounded by the airlines last November following fuel in flight that caused a fatal accident at Fort Canyon, Utah, and an emergency landing at Gallup, N.M. Cost of the grounding to the airlines has been estimated at more than \$10,000,000. Though fuel has modification expenses aggregating between \$5 million and \$6 million.

■ **Case of Mishap.** CAB investigations of the two mishaps disclosed that gasoline which overflowed while being transferred in flight between alternate tanks had entered a cove heater as result of a loose wing under the fuselage. DC-6s operating earlier have had their air intake scoops relocated on the leading edge of the wing, while the overflow vents have been conducted to the wing's trailing edge.



RADAR EYE

Altimeter malfunctions on flight near of C-47 shows clearly the working altimeter. The type set is installed in DC-6s owned by Southwest Airways. Unit gives pilot view of altimeter on 100 mile scale of plane regardless of whether altimeter. Manufacturer of 700, Denver is Aviation Maintenance Corp. (Wide World photo)

Coast-to-Coast Flights for \$99

Non-scheduled carriers again active with out-of-state passenger services in DC-6s.

Edward W. Tabor, one of the best known non-scheduled passenger carrying operators, believes his current transcontinental service is approaching the goal envisioned by three-carrier route airline operators. But his companies think he's going to wind up broke.

Operator of coast-to-coast and New York-Memphis line passenger flights since early in 1946, Tabor has recently offered a Los Angeles-New York line of \$99 plus tax. Tickets via American, United and TWA cost \$143.15 plus tax.

■ **Profit Made.** Founder of Tabor-Lawson Airlines and Trans-Los Angeles Airways, Tabor states he's making money with his coast-to-coast operations by Trans Atlantic Airways. The TAA president asserts that after he has \$100 million on one of his company's DC-6s is the cost of the customer's separate net profits.

Executives of certificated airlines, who talk in terms of 10-15 percent load-factors last fall, for their DC-6s look miserably at Tabor's current operation. But the scheduled services' two 10 percent fare increases in 1947 contributed much to the revival of non-scheduled passenger services on the transcontinental route.

■ **CAB Crackdown.** Several had zero loads in the summer and fall of 1946 and a subsequent crackdown by CAB on a number of lines merged with the scheduled carriers, who were severely restricted passenger-carrying in air traffic operations during most of 1947. Possibility of another crackdown by CAB is even present now that flights

have been resumed on a scale basis. Just how far non-scheduled carriers on a \$99 coast-to-coast line, Tabor was not ready to say when interviewed by Aviation Week. He states that his operations and scheduled carrier operators will not be ready for another an incident. At that time, Tabor may present the data to CAB in support of an application for scheduled service.

■ **Good Pay.** "We're able to make money at the low rate because we all operate at the low rate because we all work hard and won't touch concerned about putting in overtime," the TAA president declared. "In general, our people are paid better than in some other transport operations—\$50 a week for hotel meals, \$100 a month for jets and \$150 a month for complete."

"Also, we hold overhead down by cutting out all the fluff of an transportation as the ground as well as in the air. We use the 'flyover' system of operations. Coffee is served aboard the plane, but no meals. We try to land for refueling at airports where passengers will have access to a restaurant. We make more frequent stops for fuel than scheduled carriers, and we begin in payload allowance. We don't try to set speed records, but our time between Los Angeles and New York probably averages around 16 hours."

■ **Fast Route.** "We use roughly 15 pilots and operate three DC-6s, one C-45 and one DC-4. Last year we flew 30 million passenger miles."

Not at all optimistic over Tabor's chances of survival are competing non-scheduled carriers who are flying Los Angeles to New York for \$118.80. Principal West Coast carrier in the group is Viking Air Transport Co., with four DC-3s, Stinson Airliner,

with six DC-3s, and Airline Transport Carriers, with four DC-3s.

■ **Business.** Philip Wang, headed by R. R. Hott, figures it has to \$2.14 cents to break even. Despite the situation of fares approximately 25 percent lower than those of certificated lines, Wang says it is trying to avoid off-the-wall passenger business.

Company officials state they are trying to build up long-range contracts with construction firms and other companies for transporting employees and cargo.

Big Expansion Possible In Plane Utilization

Daily plane utilization by the airlines can be stepped up 50 percent in wartime, when public convenience of operations and service must be done earlier, according to American Airlines' head chairman C. B. Smith.

A major general in the Army Air Transport Command during World War II, Smith says that in peacetime utilization of eight hours a day is normal, while in wartime it can be increased to 12 hours daily without port difficulty. Speaking at the National War College, Smith declared that plan for an transportation during wartime must include assurance that one third of the personnel and equipment of the planes used by the airlines will be immediately available for military service.

Branch Proposes Probe of Feeders

Disturbed by command-upgrade requests from detachments for higher staff payments despite increases granted during the past year, CAB Member Horace Branch has called for an immediate investigation to determine whether two of the operations should be expanded.

Branch, an active area public, cited alleged contribution of additional local assets. He dissented from the action of the Board's two-man majority in adopting the temporary mail rates of 1946 and 1947, and Alaska and Hawaii. He urged an investigation "in view of constantly mounting government subsidy and the very small amount of traffic being carried."

Law Land Feared. One of the first feeders to be certificated, Missouri started operations in November, 1946. Trans-Texas began service Oct. 11. Highest passenger load factor achieved by either carrier was Missouri's 35 percent last August.

Feeder mail pay has increased steadily from the original 23 cents a plane mile rate set for Pioneer Air Lines (then Sun) in February, 1946. By October, 1947, the level had risen to 35 cents. The level for each feeder was set to 60 cents a plane mile for their first six months of operation, with the rate declining 5 cents a rate each succeeding three-month period until a 35 cents a plane mile rate is reached.

►New Proposal—Time-Texas recently asked for at least 70 cents a plane mile rate at a 10 percent load factor, with the rate graduated downward one-half cent a plane mile for each one percent increase in load factor. CAB has now proposed lifting TTA's rate to a maximum of 90 cents a plane mile for the period prior to July 1, 1948, if the carrier operates less than the basic two round-trip flights per week. After July 1, 1948, the reduction of 5 cents a plane mile in rate per mile would come at lower intervals than the basic two round-trip flights.

The CAB reports found that Missouri's mail compensation should be revised to reflect the abnormal ratio of the carrier's income (derived by its air port-to-airport airline). This "excess" refund is substantial. Some of the compensation further NAL assets. As in the Trans-Texas case, the Board lengthened the intervals between the 5-cent-a-mile downward adjustments.

Isleairline Airlines Bid

Isleairline Airlines (Isleairline H. F.), Honolulu, has asked CAB for a letter from an carrier permit for service from Honolulu to New York, and Chicago via Newfoundland and Canada.

CAB SCHEDULE

Mar. 18. Meeting on additional services to Hawaiian Islands. (Continued on p. 4)

Apr. 4. Meeting on American National Airlines' Columbia-Boston-Baltimore-New York route plan. (Continued on p. 4)

June 14. Meeting on Capitol Airlines' (CAA) mail route plan. (Continued on p. 4)

Nousked Resumes Service After 33-Day Suspension

Air cargo and passenger service between Portland, Ore., and Alaska ports has been resumed by General Air Cargo, Inc., after a 33-day suspension ordered by CAB for alleged violations of Federal regulations.

A temporary suspension order issued against the company Jan. 24 at Anchorage, Alaska, was affirmed at a later hearing held at Anchorage and concluded in Portland. The original suspension order applied to all service operated by the company, but on Feb. 9 it was modified to apply only to the Alaska service. "The order order expired Feb. 20 and service was resumed Mar. 1,"

►Change—In the complaint filed be-



CARGO COMPUTER

Moyle Brothers, United Air Lines cargo specialist, has received a "code book" to assist in freight pay-offs. It enables cargo handlers to determine quickly the correct discussion of payments by reference to a logarithmic scale production on the stick. A cargo attendant takes down the data as it is read off the code book. United and other airlines using large quantities of freight have last year seen the part through difficulties in determining cargo documents of shipments in view, due to bulk, changes are issued on a basis of one pound for each 100 lb. or of one unit. "Properly the use of the package or unit of proportion to an actual weight. For example's sake, freight handlers in the past have used as the basis of the shipper in estimating charges.

For CAB, the company was charged with operating planes in weather conditions deemed below safety requirements, carrying more passengers and more cargo than declared in manifests, failing to maintain radio or visual contact with the Anchorage airport traffic control tower, carrying cargo improperly secured, failing to carry light signals showing status and addresses of passengers and scheduling pilots to fly in excess of eight hours during a 24-hr period.

In spite of these allegations, testimony at the Portland hearing revealed that the airline had operated 170 flights between Portland and Alaska without loss or injury to passengers or cargo.

In addition to the Portland-Alaska service, General Air Cargo operates planes between Portland and Utah and California ports.

Higher Mail Payments Offered Colonial Airlines

Colonial Airlines faces a brighter financial future after a net loss of \$957,711 and an operating loss of \$775,913 as domestic service in 1947. CAB has moved to increase mail payments 75 percent retroactive to Jan. 1.

A Board show case order would boost Colonial's temporary mail rate on its U. S. and Canadian links from the 20 cents a plane mile received last year to 35 cents a plane mile. The carrier received \$758,994 in mail pay in 1947, and the new rate would yield around \$1,000,000 in 1948. Colonial asked for pay per percent of 50 cents a plane mile.

The increased temporary rate was set to provide Colonial with immediate financial assistance and to prevent disruption of its working capital. Later, CAB will fix a permanent rate, retroactive to Apr. 15, 1946, which is expected to cut deficits experienced since that date.

Services Consolidated

Challenger Airlines and Monarch Air Lines have arranged to combine their traffic and sales divisions under the direction of Gerald S. Kierhen, general traffic and sales manager of MAF. Officials of the feeder and the new would result in greater economies, more efficiency and better service.

Parcel Post Extended

International air parcel post service has been extended to Portugal and the Azores in addition to the 21 countries announced last week (Aviation Week, Mar. 8).

Industry Endorses Congressional Study

Airline top executives urge prompt implementation of latest air policy report.

The air transport industry has endorsed the Congressional Aviation Policy Board's report (AVIATION WEEK, Mar. 1) with the same enthusiasm that marked earlier endorsement of the study made by the President's Air Policy Commission early in January.

Despite adoption of the recommendations in face of difficulties now faced by U. S. domestic and international air carriers is being urged by top industry marshals. The Congressional group already is considering possible legislation and will issue comments from CAB, CAA and other interested government agencies.

►Land Comments—Air Transport Association President Royce S. Lind told the while one may not agree with every finding of the Congressional Board, the report is a whole as an admirable guide to U. S. policy. "If the principles embodied in the report are followed, and the recommendations implemented as soon as practicable, American will be superior in the air to anywhere as well as in warfare," Lind declared. Similar praise for the Board's work came from Warren Lee Parsons, TWA board chairman.

Using different language, but with equal forcefulness, the Congressional group echoed the Presidential Air Policy Commission's call for a strong domestic and international commercial air transport sector which will be immediately available in the event of national emergency.

The Congressional report said that "it is an emergency should be declared and permitted by whatever means appear most practical until it reaches such status as passenger and cargo capacity so to continue during crises as adequate logistical air arm of the national defense establishment." It added that civil and military aviation are indivisible in meeting total American air strength.

►Development Funds—A recommendation by the President's Commission was that the government should finance development of commercial planes which could be used by the armed services in wartime as well as in peacetime. The Congressional group funds would be allocated to the Air Force and earmarked for the specific purpose.

"Transport aircraft of naturally better operating and airframe characteristics than any new being built are needed to provide the low operating cost and high performance that will make possible economical operations

of large numbers of aircraft. As the government is vitally concerned in the outcome of a large fleet of modern aircraft, it is in the interest of economy that the government finance the design and building of such prototypes, whatever the carrier may buy the production aircraft, and pay for them by contracts derived from commercial aviation."

►Planning Board—The Congressional report urged that a Civil Air Transport Extension and Development Board (similar to the setup proposed by the President's Commission) should be established. It would consist of representatives of the Air Force, the Navy,

other government agencies concerned with aeronautics, the aircraft manufacturing industry and the airlines. The board would be charged with drawing up specifications and developing prototypes of the new transports.

It was suggested that form contracts be prepared now for wartime production by the armed services of all U. S. commercial planes flying internationally, except for those specifically exempted by the Department of National Defense. Form contracts would also be prepared for wartime utilization of a percentage of domestic airline aircraft. The Congressional group saw an obligation by the airlines to provide such

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available at reasonable cost on future for Federal expenditures in the form of cost-plus, unit-price development and incentive.

► **Cargo Pioneers**—In establishing special warehouses standards for cargo aircraft was expressed. The report and implementation of cargo plane requirements should be the goal for a joint executive restructuring manufacturers, airlines and CAB.

Both policy groups agreed that CAB should be given power to regulate contract and charter operations, that establishment of domestic air travel is desirable and that Congress should give consideration to carrying all first-class seats by air which can be expedited by such handling. The Congressional group requested the CAB to give the airlines to achieve economies by joint operation of ground facilities.

Western Pushes Rerentrenchment

President Drinkwater describes organizational readjustments to control employment and reduce purchases.

By SCHOLLEY RANGS

Western Air Lines' drive for economy and financial stability is pegged to a broad program of internal rerentrenchment as well as to consolidation of ground services with other carriers whenever possible.

While it is still too early to place an economic evaluation on the past ground service agreements negotiated by WAI, at 14 cities during the past six months, Western's March 31, 1947, audit of the budget remains an already agreed.

► **Buying Power**—At the start of 1947, President J. C. Drinkwater placed in effect a freeze order against new purchases and new equipment. Orders were issued for departmental staff reductions and consolidations. Western's publicity staff, at one time approaching a "little company" status, was reduced to two men and a secretary. The department's photo laboratory was closed entirely.

The company's traveling advertising department was consolidated with the publicity department. Its functions—aided by a staff member transferred from the sales department—were taken over by Kenneth E. Allen, publicity director, who is now director of advertising and publicity. Two company mail rooms were consolidated. With a travel establishment, staff cuts and consolidations progressed and continued.

► **Costs Cut**—Operating costs, which had reached a high of 14.7 cents per available ton mile flown during 1946, dropped to 10 cents by last August. Despite rising supply prices and pay rates

► **Proctor Criticisms**—The two reports delivered that leadership should be re-authorized for the limited of three years. Most of the tax transportation, which cost airline passengers \$44,530,000 in 1947, was recommended.

The proposal that CAB should take over CAA's duties of administering the Civil Air Regulations was supported in view of findings that CAB has been unable to organize its work in a business-like manner. Whereas the President's Commission had urged that CAB be increased to seven members to handle its present work load (aircraft safety investigation), the Congressional group said a five-man board should be continued despite the increased duties recommended. The Congressional group requested the CAB to give the executive Director to administer the Civil Air Regulations.

Average pay per employee increased from \$22.5 a month in 1946 to \$28.1 a month in 1947.

Reentrenchment activity as well as long-range must be combined with having in mind the 1947 budgeting program. At the close of 1946 Western showed a net loss of nearly \$1,000,000. Outstanding debts included bank loans at close to \$5,000,000, bills of nearly \$3,000,000, and bills payable for the carrier's new hangar and general offices at Los Angeles airport, \$600,000 to Federal Engineering Corp. (Stanford Oil Co. of California), nearly \$225,000 to Pacific Development Corp., approximately \$400,000 to War Assets Administration, and about \$1,000,000 to Douglas Aircraft Co. for DC-4 conversions.

► **Plane Deal**—In order to follow through on its order for 18 DC-4s, Western avoided a consolidation parallel to Douglas by canceling five planes and working out a deal under which United Air Lines submitted the order for the remaining five.

While lowering its expenditures with a more compact staff, Western also has advanced financial capabilities. After showing a large book profit on the sale of Route 68, Western was granted a \$4,900,000 loan by the Reconstruction Finance Agency. With that money it has paid off all its outstanding debts, totaling \$700,000 toward its purchase of 10 Convair-Lorons.

► **Net Profit**—Results of the economy program became evident in the audit and staff budget brought a fourth-quarter

operational loss of \$554,000—well below the \$832,000 operational deficit expected in the first nine months of 1947.

With the help of profits from the sale of the Denver-Los Angeles route Western during 1947 showed net earnings of \$613,000. Operating loss was \$165,675 last year—down from the 1946 operating loss of \$1,231,000.

Costly as was the construction of Western's new office-hanger building, it has proved useful in cutting expenses incurred in maintaining practically-squashed business and operating facilities in Burbank, Los Angeles, Hollywood and Beverly Hills.

► **Overst Position**—To Drinkwater, domestic air transport's collapse over the past few months, locally, and nationally, is a problem of the industry as a whole, resulting from the postwar boom in air travel and route extensions. He points out that many carriers just now are beginning to reduce their expanded staffs in keeping with this outcome.

Western has learned its lesson. Drinkwater states, and during his last year will become a victim of the age in expanded staffs, the chief of the carrier's economy program will not cut until operational costs have been brought to the lowest possible point.

(This is the second of two articles on Western Air Lines' economy drive.)

Alaska Airlines Expands Nonscheduled Activity

Alaska Airlines, which has been active in non-scheduled operations between Alaska and the Pacific Northwest, has started irregular freight and passenger service between Anchorage, Fairbanks, Cordova, Fair, Merrill, and Chicago. It plans to conduct about six flights monthly with DC-4s. Passengers and cargo rates reportedly will be about one-third less than those charged by Northwest Airlines on its Chicago-Merlin service.

One Alaska Airlines spokesman said his company has authorized flights to the Northwest because Alaska, fuel, taxes, eggs and other products can be purchased at lower prices than in the Pacific Northwest. Most of the carrier's cargo to Alaska consists of food stuffs.

The company's unscheduled flights to the Seattle area have been under fire from the American Airlines and CAB. The Board early this year ordered Alaska Airlines to cease and desist from carrying passengers on a common carrier basis between Alaska and continental U. S. Recent Alaska activity has forced the company's planner, David A. Johnson, to resign. South Alaska,

covering segments from England.

Early this month, the carrier was to open Alaska and a maintenance base at Great Falls, Mont. Meanwhile, President James A. Moore announced the appointment of Edward S. Madison as vice president and Robert L. Stewart as director of engineering and maintenance. For the present they will be based at Juneau Field, Everett, Wash., where Alaska Airlines is operating a major overhaul and maintenance base.

Final Traffic Totals For 1947 Issued

U. S. domestic air travel in 1947 showed its smallest rate of gain in more than 15 years, according to the war just 1947 when the government took over many commercial planes.

Final figures of Air Transport Association disclose that domestic revenue passenger miles flown last year by certificated carriers, including foreign, totaled 6,101,250,000, a gain of 2.99 percent over 1946. Revenue passenger miles increased 5.64 percent to 12,838,001.

► **Downward Revision**—These statistics represent a downward revision of AATA's December estimate. At that time (Aviation Week, Dec. 28), domestic revenue passenger miles for 1947 were expected to total 6,384,750,000 and revenue passengers 13,139,566.

Despite the small gains, the 1947 figures are encouraging when contrasted with passenger travel by bus and train. During the last six months of 1947, railroads, airlines, bus and truck and bus passengers miles were down 42, 31 and 5 percent, respectively, compared with the same 1946 period.

► **Other Totals**—Domestic arrival and departure flights were down 1.4 percent, a result of the decrease originally anticipated. Mail ton miles in 1947 totaled 31,013,695, up 0.24 percent. This compares with a drop of nearly 30 percent in domestic cargo tonnage in the same year of 1945 and 1946.

Domestic airfreight in 1947 was up 83.61 percent to a total of 15,644,805 ton miles, up 19.24 percent to 78,763,174 ton miles, and revenue passenger load factor down to 65.12 percent from 78.34 percent in 1946.

Internationally, U. S. carriers in 1947 reversed their revenue passenger mileage—64.51 percent to 1,410,512,000 miles, up 1.41 percent to 1,435,330,000 miles, and revenue passenger load factor down to 65.12 percent from 78.34 percent in 1946.

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SHORTLINES

- **All American**—Hopes to begin service to coast ports on Maryland's Eastern shore on May 15. Route was authorized in CAB's recent middle Atlantic area decision.
- **BOMC**—On Mar. 19 expects to announce the first commercial air service between the United Kingdom and Japan. Plymouth flying boats carrying 22 passengers will make one round-trip weekly. Company's Atlantic division carried 23,199 passengers and 1,185,473 lb. of cargo between April 1 and Dec. 31, 1947.
- **Capital (PCA)**—Carried 1,775,000 lb. of cargo in January compared with 1,758,818 lb. in same month last year.
- **Continental**—Has been authorized by CAB to include London-Fort 54L, Okla. as an AM 20 intermediate point between Wichita Falls, Tex., and Oklahoma City for a two-year period.
- **McDonnell**—Reports a net loss of \$26,252 in January against a deficit of \$26,252 in same 1947 month. Operating assets were up 25 percent but the percentage load factor dropped from 63.91 percent in January, 1947, to 56.35 percent in January, 1948.
- **Norfolk**—Will operate three round-

trip daily when it starts service Mar. 15 between Detroit and Washington via Cleveland and Pittsburgh. One trip will be with Martin 202 equipped and the other with DC-4.

► **Pan American**—Has been authorized to serve Delhi, India, as an intermediate point between Karachi and Calcutta.

► **Pennair International**—Has increased New York-Lima service from two to four round-trips weekly.

► **TACA**—Recently placed in operation its \$1,900,000 mail and mailcarriage base at Mount International Airport, New Orleans. Movement of all operations except the president's office from Mobile to New Orleans has been completed. Company's service between New Orleans and Central America has been increased to three flights weekly.

► **Texas Air Lines**—The Houston-based all-cargo carrier flew 1,911,314 lbs. in January.

► **TWA**—Blaine, Ind., has become a regular weekly stop on the Boeing run.

► **United**—Installation of radar altimeters on UAL's fleet of 109 planes has been completed. Aircraft in January totaled 1,117,591 lbs. mail against 460,383 in January, 1947. Express increased from 449,242 to 601,752 lbs. mail.

► **West Coast**—Will offer 15 percent reduction on a book of six tickets and 10 percent reduction on books of 12 tickets for its "Seaside" map out of Portland and Seattle.

Dwight Korte Leaves Western Airlines

Leo H. Dwight, executive vice president and director of Western Air Lines, has resigned.

Dwight will serve as consultant to the company on pending rate applications and other financial matters. He has not announced any other plans.

- **Other personnel developments**
- **American**—Victor Vinton, associated with AA for nearly 15 years and assistant to President Ralph S. Dawson since April, 1945, has resigned to become an executive consultant.
- **Flying Tiger Line**—Lawrence Knabell, formerly director of public relations with TWA, has joined the sales staff.
- **Norfolk**—R. D. McKenna, director of sales, has been moved to the newly-created position of Executive director with headquarters in London.
- **Pennair**—Robert J. Smith, PAI, president, has been promoted to Brigadier General in the Air Force Reserve.
- **Shenandoah**—C. Grant has been appointed secretary.
- **TWA**—J. H. Wakenham has been named system safety manager and John L. Washington assistant manager of passenger sales.

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SEARCHLIGHT SECTION

- **EMPLOYMENT**—(Continued)
- **BUSINESS**—(Continued)
- **EQUIPMENT**—(Continued)
- **OPPORTUNITIES**—(Continued)
- **DISPATCHES**—(Continued)

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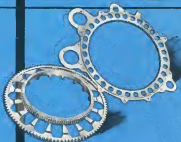
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